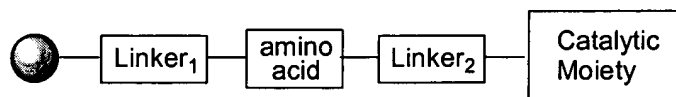


Claims

Claims 1 - 20 (canceled)

21. **(original)** A library of potential catalysts, and the individual members thereof, having the following general structure:



wherein

the sphere represents a solid support;

Linker₁ and Linker₂ are independently selected from the group consisting of difunctional molecules with or without sidechains and/or stereocenters;

amino acid represents a natural or unnatural amino acid; and

the catalytic moiety is selected from the set comprising the catalytically-active portions of known catalysts.

22. **(original)** The library and individual catalysts of claim 21, wherein

Linker₁ and Linker₂ are independently selected from the set comprising diamines, diols, amino alcohols, and diacids; and

the catalytic moiety is selected from the set comprising salenates, porphyrins, Schiff base-containing moieties, diketopiperazines, oligoamines, oligoalcohols, amino alcohols, oligopeptides, and oligonucleotides.

23. **(original)** The library and individual catalysts of claim 22, wherein the catalytic moiety is mono-, di-, tri-, or tetra-dentate with respect to a substrate.
24. **(original)** The library of claims 21, 22 or 23, wherein the library comprises at least one hundred potential catalysts.
25. **(original)** The library of claims 21, 22 or 23, wherein the library comprises at least one thousand potential catalysts.

26. **(original)** The library of claims 21, 22 or 23, wherein the library comprises at least ten thousand potential catalysts.
27. **(original)** The library and individual catalysts of claims 21, 22 or 23, wherein a selected catalyst is used as the lead structure for a second library of potential catalysts; said second library of potential catalysts is screened to identify those members that catalyze the transformation of interest; at least one of the members of the second library being an improved catalyst for the transformation of interest relative to the catalyst from the first library.
28. **(original)** The library and individual catalysts of claim 27, wherein the described process is reiterated between one and ten additional times to provide at least one improved catalyst for the transformation of interest.
29. **(original)** The method of claims 27 or 28, wherein a selected catalyst catalyzes a transformation selected from the set comprising kinetic resolutions, regioselective reactions, chemoselective reactions, diastereoselective reactions, stereoselective reactions, functional group interconversions, hydrogenations, oxidations, reductions, resolutions of racemic mixtures, cycloadditions, sigmatropic rearrangements, electrocyclic reactions, ring-openings, carbonyl additions, carbonyl reductions, olefin additions, olefin reductions, imine additions, imine reductions, olefin epoxidations, olefin aziridinations, carbon-carbon bond formations, carbon-heteroatom bond formations, and heteroatom-heteroatom bond formations.
30. **(original)** The method of claims 27 or 28, wherein the catalysts are selected based on the observation of a detectable event.
31. **(original)** The method of claim 30, wherein the detectable event is a member of the set comprising the evolution of a gas, the emission of a photon, and the formation of a precipitate.

Claims 32-54 **(canceled)**